
The National ITS Architecture
An Introduction for
FTA Senior Staff
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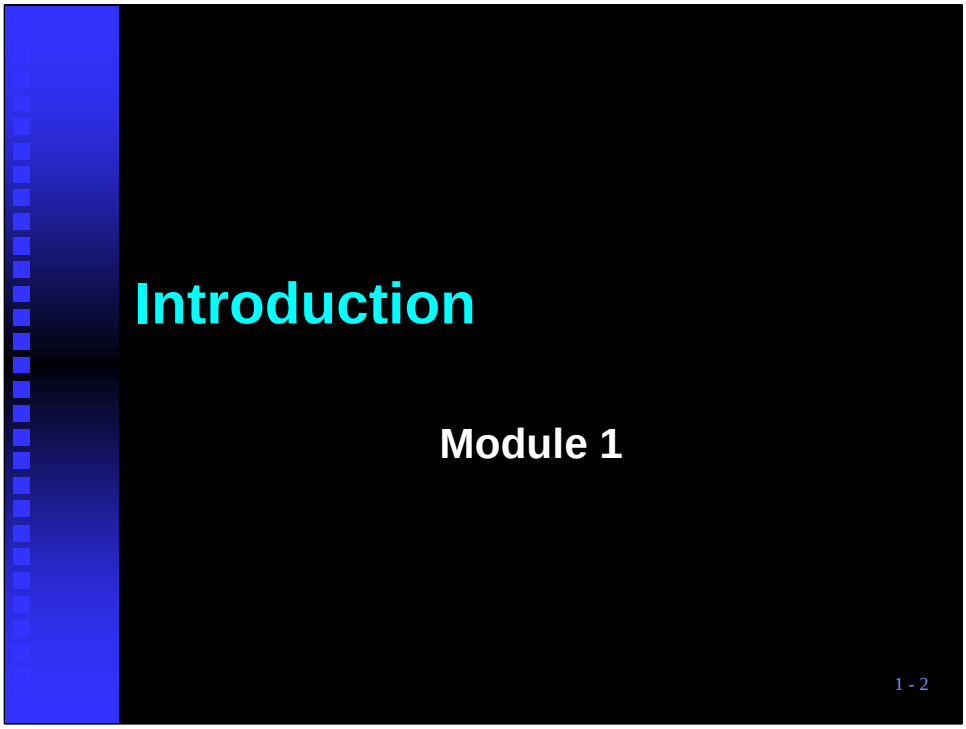
Introduction
Module 1
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Course Agenda

- Introduction
- The National ITS Architecture
- Communications & Standards
- Integrating the National ITS Architecture in Transit Projects
- Case Studies/ Discussion

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Course Goals

- To provide, from a transit perspective, a lay-person terminology overview of the:
  - National Architecture and ITS standards
  - Conformity requirements of TEA-21
- To prepare FTA staff for the one day "National ITS Architecture and Consistency Policy Seminar"
- To provide an opportunity for FTA senior staff to meaningfully discuss the implications of the National ITS Architecture for FTA with the assistance of policy and technical experts

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Module Outline

- Why are we here?
- TEA-21
- Why was the National ITS Architecture needed?
- Integration of ITS
- National ITS Architecture Conformity: a recommended approach

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Why Are We Here?

- How the National ITS Architecture affects you
- Intermodal opportunities
- Benefits of conformity
  - Lower cost
  - ITS Integration
  - Less Risk

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TEA-21

- **Section 5206: National Architecture and Standards**
  - **Section 5206 (e): Conformity with National Architecture**

"… the Secretary shall ensure that intelligent transportation system projects carried out using funds made available from the Highway Trust Fund, including funds made available under this subtitle to deploy intelligent transportation system technologies, conform to the national architecture, applicable standards or provisional standards, and protocols…"

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TEA-21: ITS Program Funding

- ITS infrastructure deployment ($679m over 6 years)
  - ITS Integration Program
  - CVI infrastructure
- R&D ($603m over 6 years)
  - IVI, metropolitan travel management, rural ITS, APTS, CVI
  - Architecture maintenance, standards development, providing training

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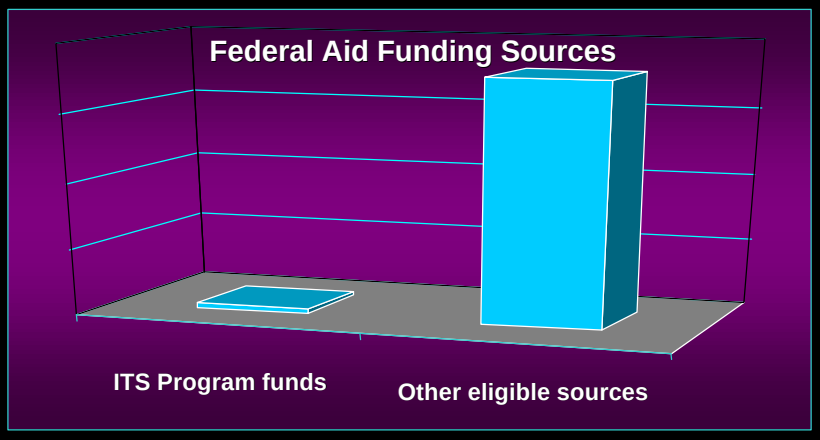
TEA-21: Funding



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Intelligent Transportation Systems

DEFINITION

Application of advanced technologies to improve the safety and efficiency of surface transportation systems

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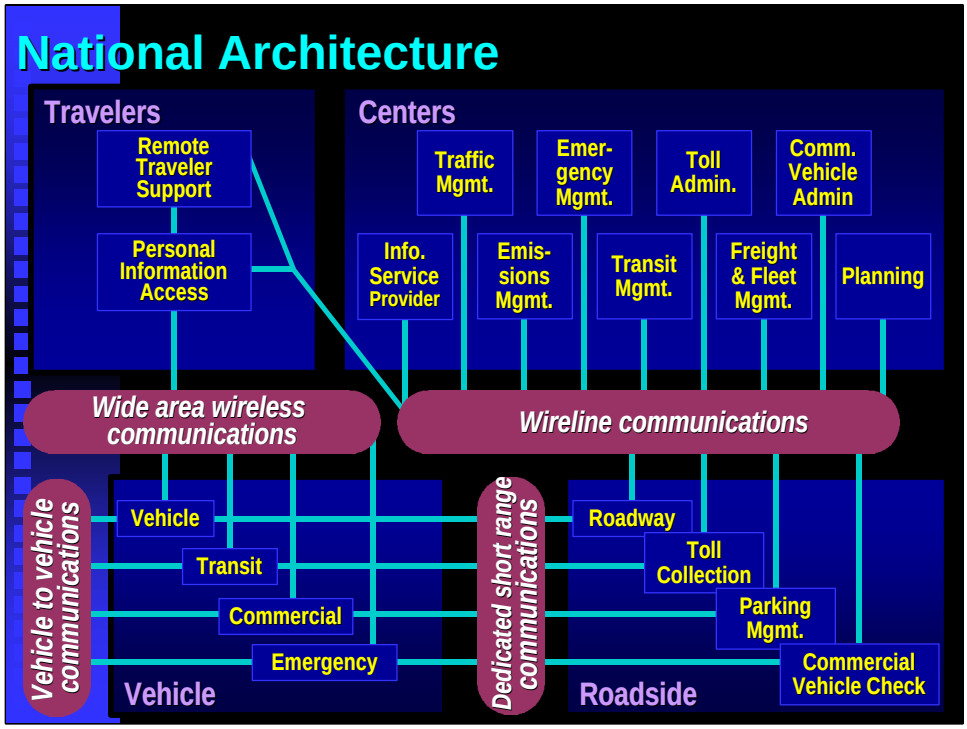
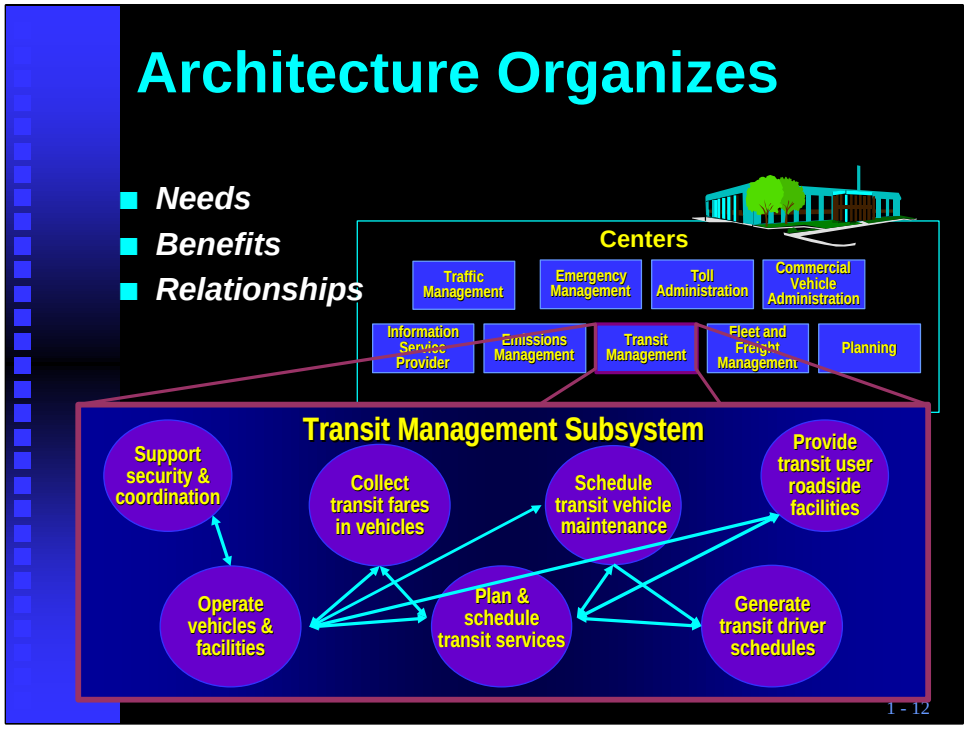

National Architecture
Travelers
Remote Traveler Support
Personal Information Access
Centers
Traffic Mgmt.
Emer-gency Mgmt.
Toll Admin.
Comm. Vehicle Admin
Info. Service Provider
Emis-sions Mgmt.
Transit Mgmt.
Freight & Fleet Mgmt.
Planning
Wide area wireless communications
Wireline communications
Vehicle to vehicle communications
Vehicle
Transit
Commercial
Emergency
Vehicle
Dedicated short range communications
Roadway
Toll Collection
Parking Mgmt.
Commercial Vehicle Check
Roadside


Architecture Organizes
Needs
Benefits
Relationships
Centers
Traffic Management
Emergency Management
Toll Administration
Commercial Vehicle Administration
Information Service Provider
Emissions Management
Transit Management
Fleet and Freight Management
Planning
Transit Management Subsystem
Support security & coordination
Collect transit fares in vehicles
Schedule transit vehicle maintenance
Provide transit user roadside facilities
Operate vehicles & facilities
Plan & schedule transit services
Generate transit driver schedules
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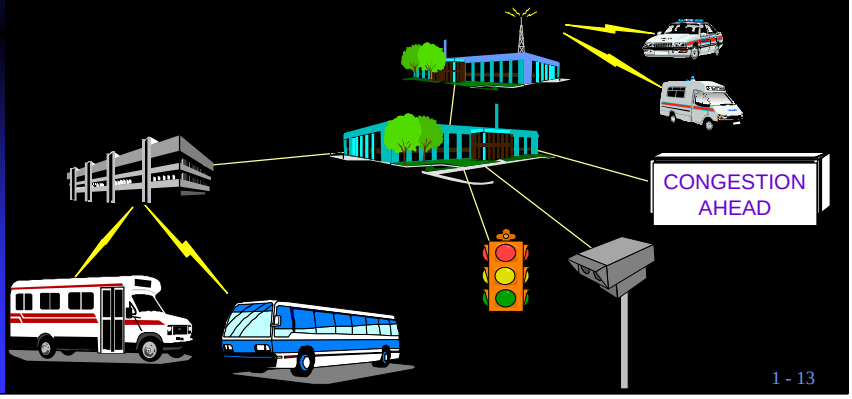
Why Was the National ITS Architecture Needed?

- Addresses ITS complexity
- Enhances ITS integration



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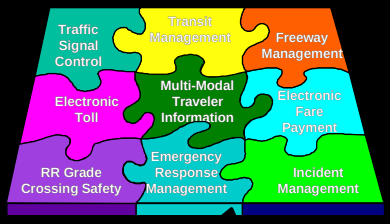
Integration of ITS



National ITS Architecture

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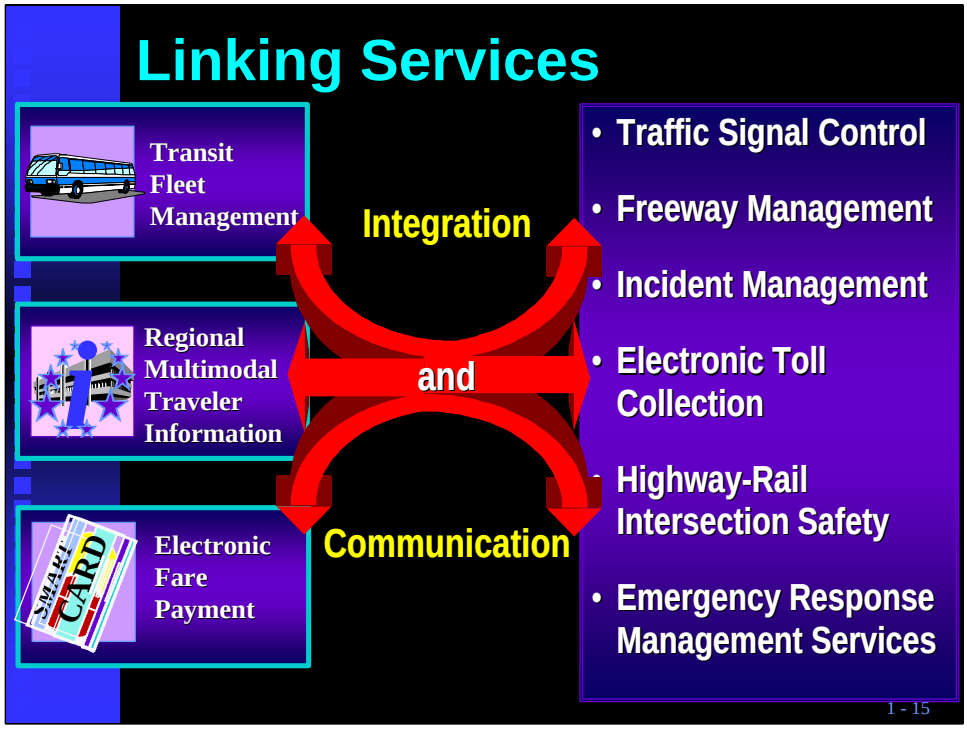
Linking Services
Transit Fleet Management
Regional Multimodal Traveler Information
Electronic Fare Payment
SMART CARD
Integration
and
Communication
• Traffic Signal Control
• Freeway Management
• Incident Management
• Electronic Toll Collection
• Highway-Rail Intersection Safety
• Emergency Response Management Services
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Integration Is Critical

- ITS works better
- Better use of scarce resources
- Data sharing
- Team-building

The whole is greater than the sum of its parts

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Current Efforts in Fostering ITS Integration

- Training
- Technical guidance
- Standards
- Architecture conformity

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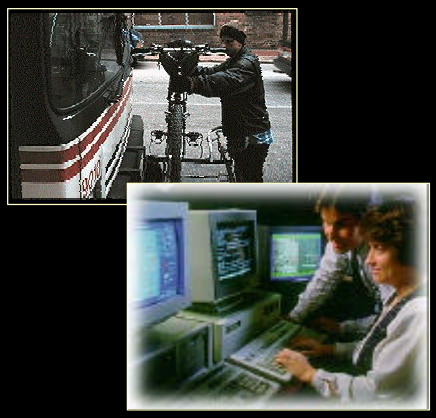
National ITS Architecture: Conformity Helps You

- A resource for local decision making
- A tool to help guide you through this process



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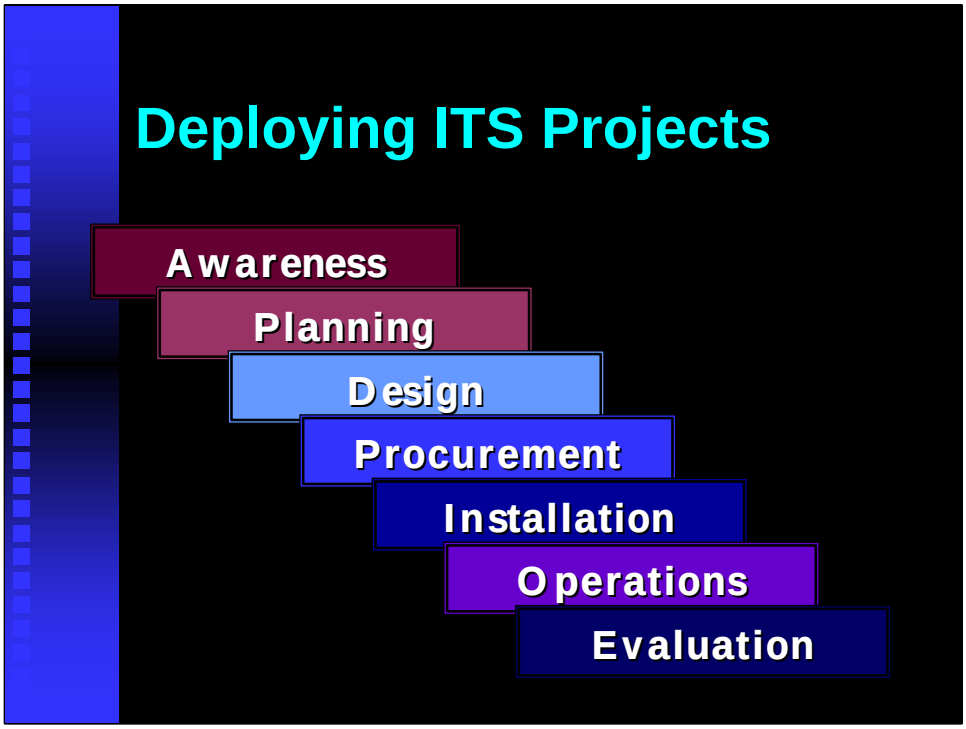
Deploying ITS Projects
Awareness
Planning
Design
Procurement
Installation
Operations
Evaluation

Recommended Approach

- Assess current/planned projects
- Ask: Do you have a regional architecture?
- Conform to architecture on projects
  - Interim Guidance
  - A Vision
  - Planning
  - Design and deployment

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Conformance on Projects: Interim Guidance Objectives

- Spurring integration
  - Focus on near-term ITS projects that can spur integration
- Mainstreaming
  - Incorporate ITS into the transportation planning process

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Conformance on Projects: Spurring Integration

- Institutional
  - Get stakeholder involvement
- Technical
  - Conform to architecture
    - Regional
    - National
  - Use ITS standards

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Conformance on Projects: Mainstreaming

- Work towards regional implementation of ITS services
- Develop regional architecture

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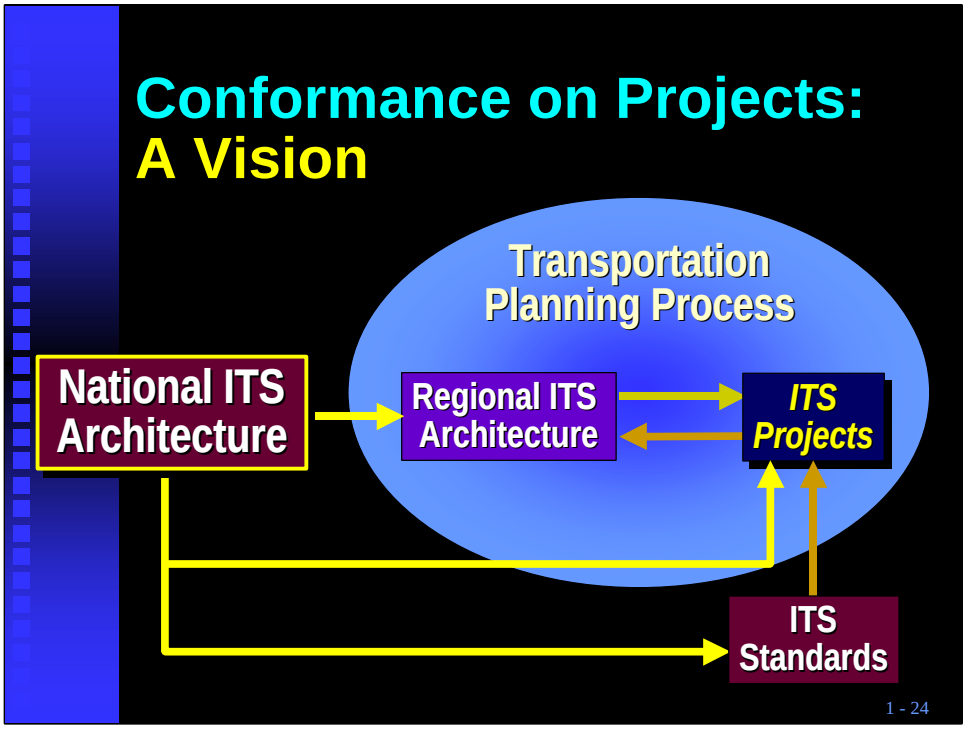
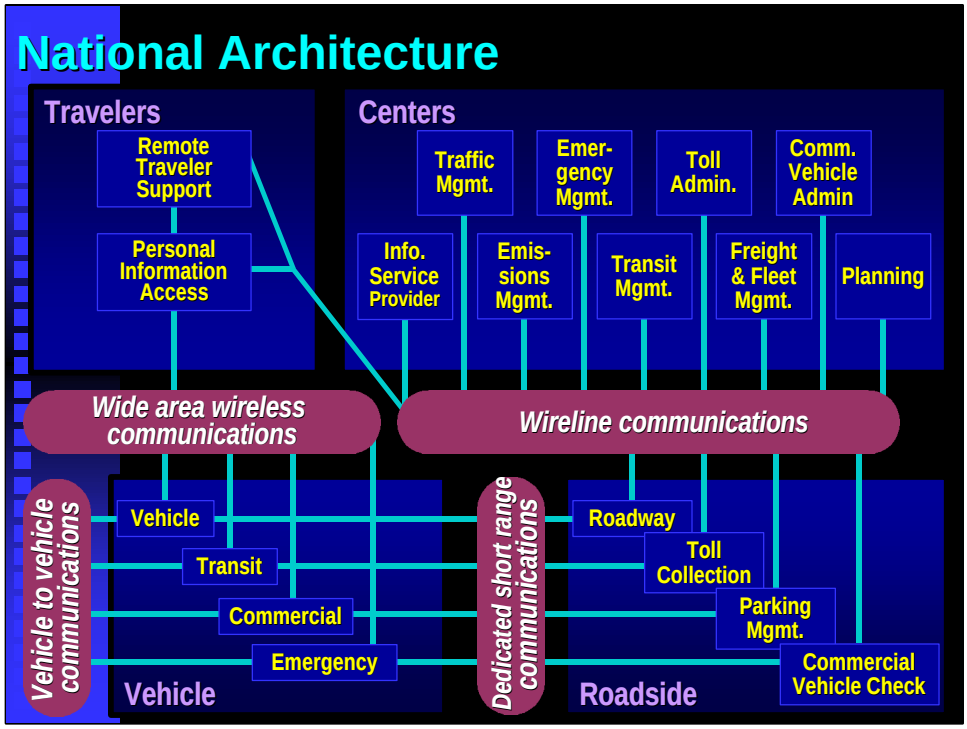

Conformance on Projects:
A Vision
Transportation
Planning Process
National ITS
Architecture
Regional ITS
Architecture
ITS
Projects
ITS
Standards
1 - 24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Emergency
Vehicle
Dedicated short range communications
Roadway
Toll Collection
Parking Mgmt.
Commercial Vehicle Check
Roadside

TABLE 1: ITS PROJECT KEYS TO SUCCESS	
What	
Start small	• Break projects up into components and start small as resources allow. • Keep in mind integration with other modes, with other projects, and with the future.

Define the project precisely	• Define the project early, in the planning and design stages, with precise limits on what is to be developed and constructed.
	  • Any subsequent change nearly always promotes disorder, confusion, and increased costs.
	• Ask yourself if you are trying to get a service or a product.
	  • This distinction can help to minimize risk.
	• Understand the existing planning process.
	• Prove that ITS addresses your transportation needs.
	• Focus on customer service.
	• Recognize and plan for ITS operational requirements.
	• Understand the functions and activities discussed in this lesson.

Who	

Identify champions	• Every project needs an identified, primary champion.
	  • for clarification of leadership
	  • for resolution of internal conflicts
	  • as a spokesperson
	  • According to feedback from agencies with successful ITS projects, a champion is essential.

Get local support	• Local support from residents, public interest groups, and business interests is essential for the flow of the project. • Be sure to share information with others that are critical to implementing an integrated system inside and outside of your organization. • If land acquisition is part of the project, the land needs to be acquired early in the process so that the project won't be held up by last minute negotiations.
Assemble a management team	• Include interested parties and the experts you need.

How	

Share risks	Use flexibility in how you approach risks:
	• Accept an appropriate share of the risks incurred:
	  • financial
	  • resources
	  • manpower
	  • time
	• Clearly identify and separate:
	  • financial risks
	  • design risks
	  • software development and integration risks
	  • implementation risks
	• Assign more risk to the party with the most opportunity for financial gain.
	• Assign each risk to the party who can best control it, and still survive should the risk become reality.
	  • e.g., tie software deadlines to paying the contractor
	• Use the national architecture and standard interfaces to help minimize risks.

Identify obstacles	• The key people you need to convince, such as elected officials and staff may be unfamiliar with ITS. • Successful integration requires coordination inside and between modes. • Your own staff may have limited resources and experience. • You may be hindered by the lack of data on ITS benefits and costs. • You may have commitments to other projects.

Analyze benefits for the stakeholders	• Identify non-traditional transit problems in your area, e.g. :
	  • passenger mobility rather than facility congestion
	  • passenger travel time reduction on public transit
	  • reduction in accidents
	• Identify the cause of the problems:
	  • is it caused by lack of information?
	  • is it caused by demand peaks?
	• Consider ITS as an independent solution, and as a part of a traditional solution.
	• Make sure evaluation methods of traditional and ITS projects are equivalent.
	  • Know the limitations of traditional analysis tools, e.g., do they address mobility needs?
	• Do not oversell the project to management:
	  • Be realistic and specific - avoid benefits claims that you cannot quantify.
	• Do not undersell the project to management:
	  • Your benefits analysis will make the project gain approval.
	• Non-traditional benefits analysis:
	  • Provide a simulation (as you may have seen in an earlier exercise) to help quantify benefits.
	  • Address various market segments to clarify benefits, e.g., the five rural market segments identified by Advanced Rural Transportation Systems.